WHAT IS CLAIMED IS:

1. An ultrasonic imaging system for transmitting an ultrasonic pulse to a living body, receiving the ultrasonic pulse reflected by said living body, and obtaining B-mode image data of said living body, comprising:

a structure extractor for extracting structure-emphasized image data in which a structure of a tissue in said living body is emphasized from said B-mode image data;

a texture pattern extractor for extracting texture-emphasized image data in which a texture pattern coming from properties of a tissue in said living body is emphasized from said B-mode image data;

an image synthesizer for obtaining a synthesized image by weighting and combining said structure-emphasized image data and said texture-emphasized image data; and

a display for displaying at least one of said structure-emphasized image data, said texture-emphasized image data, and said synthesized image.

2. The ultrasonic imaging system according to claim 1, wherein two synthesized images to which different weights are assigned are displayed side by side.

3. The ultrasonic imaging system according to claim 1, wherein said structure extractor extracts a

structure of a living body tissue constructed by a set of point reflectors which are continuously distributed in at least one direction in said living body.

4. The ultrasonic imaging system according to claim 1, wherein said texture pattern extractor extracts a component coming from a reflector constructed by a set of point reflectors which are not continuously distributed in said living body but are spread.

5. The ultrasonic imaging system according to claim 1, wherein said structure extractor comprises:

means for determining a region of peripheral pixels of each pixel in said B-mode image data; and

means for obtaining a function for determining a weighting function on the basis of the difference between intensity of said each pixel and intensity of each of said peripheral pixels,

said function has a maximum point when it is 0,

an integral value of an absolute value of said function in a region from negative infinity to positive infinity is finite,

said weighting function on each of said peripheral pixels is determined from differentiation of said function, and

a value obtained by adding a sum of products of said weighting function and intensity of each of said peripheral pixels to intensity of each of pixels of

said B-mode image data is used as signal intensity of each of pixels of said structure-emphasized image data.

6. The ultrasonic imaging system according to claim 1, further comprising a parameter controller for setting parameters for signal processing into said structure extractor, said texture pattern extractor, and said image synthesizer on the basis of a distribution of signal intensities of pixels in the same frame of said B-mode image data.

7. The ultrasonic imaging system according to claim 1, wherein said texture pattern extractor emphasizes said texture pattern by using a differential filter in two directions of signal intensities of pixels in the same frame of said B-mode image data.

8. An ultrasonic imaging system comprising:

an ultrasonic probe having a plurality of ultrasonic elements, for transmitting an ultrasonic pulse to a living body, and receiving the ultrasonic pulse reflected by said living body;

a transmit beam former for outputting a transmit signal of an ultrasonic wave transmitted from said ultrasonic probe;

a receive beam former for generating an RF signal as a receive beam signal from a signal received from said ultrasonic probe and outputting the RF

signal;

a transmit/receive switch for switching transmission and reception of the ultrasonic wave to/from said ultrasonic probe;

an envelope detector for detecting an envelope of said RF signal and outputting the envelope as a video signal;

a scan converter to which said video signal is input;

a structure extractor for extracting structure-emphasized image data in which a structure of a tissue in said living body is emphasized from an output of said scan converter;

a texture pattern extractor for extracting texture-emphasized image data in which a texture pattern coming from properties of a tissue in said living body is emphasized from an output of said scan converter;

an image synthesizer for obtaining a synthesized image by weighting and combining said structure-emphasized image data and said texture-emphasized image data;

a parameter controller for setting parameters for signal processing into said structure extractor, said texture pattern extractor, and said image synthesizer;

an input unit for receiving said parameters for signal processing and setting said parameters for

signal processing into said parameter controller;

a control unit for controlling said transmit beam former, said transmit/receive switch, and said receive beam former on the basis of the control parameters supplied from said input unit; and

a display for displaying at least one of said structure-emphasized image data, said texture-emphasized image data, and said synthesized image.

9. The ultrasonic imaging system according to claim 8, wherein said parameter controller sets said parameters for signal processing on the basis of said video signal.

10. The ultrasonic imaging system according to claim 8, wherein said control unit sets information regarding said ultrasonic probe and information regarding an image target region in said living body into said parameter controller.

11. The ultrasonic imaging system according to claim 8, further comprising a rendering processor for generating data for three-dimensionally displaying an image target region in said living body from an output of said image synthesizer,

wherein said image target region in said living body is three-dimensionally displayed on said display.

12. An ultrasonic imaging system comprising:

an ultrasonic probe having a plurality of ultrasonic elements, for transmitting an ultrasonic pulse to a living body, and receiving the ultrasonic pulse reflected by said living body;

a transmit beam former for outputting a transmit signal of an ultrasonic wave transmitted from said ultrasonic probe;

a receive beam former for generating an RF signal as a receive beam signal from a signal received by said ultrasonic probe and outputting the RF signal;

a transmit/receive switch for switching transmission and reception of the ultrasonic wave to/from said ultrasonic probe;

a structure extractor for extracting structure-emphasized image data in which a structure of a tissue in said living body is emphasized from said RF signal;

a texture pattern extractor for extracting texture-emphasized image data in which a texture pattern coming from properties of a tissue in said living body is emphasized from said RF signal;

an image synthesizer for obtaining a synthesized image by weighting and combining said structure-emphasized image data and said texture-emphasized image data;

an envelope detector for detecting an envelope of an output signal of said image synthesizer and outputting the envelope as a video signal;

a scan converter to which said video signal is input;

a parameter controller for setting parameters for signal processing into said structure extractor, said texture pattern extractor, and said image synthesizer;

an input unit for receiving said parameters for signal processing and setting said parameters for signal processing into said parameter controller;

a control unit for controlling said transmit beam former, said transmit/receive switch, and said receive beam former on the basis of the control parameters supplied from said input unit; and

a display for displaying at least one of said structure-emphasized image data, said texture-emphasized image data, and said synthesized image.

13. The ultrasonic imaging system according to claim 12, wherein said parameter controller sets said parameters for signal processing on the basis of said receive signal.

14. An ultrasonic imaging system comprising:

an ultrasonic probe having a plurality of ultrasonic elements, for transmitting an ultrasonic pulse to a living body, and receiving the ultrasonic pulse reflected by said living body;

a transmit beam former for outputting a transmit

signal of an ultrasonic wave transmitted from said ultrasonic probe;

a receive beam former for generating an RF signal as a receive beam signal from a signal received from said ultrasonic probe and outputting the RF signal;

a transmit/receive switch for switching transmission and reception of the ultrasonic wave to/from said ultrasonic probe;

an envelope detector for detecting an envelope of said RF signal and outputting the envelope as a video signal;

a structure extractor for extracting structure-emphasized image data in which a structure of a tissue in said living body is emphasized from said video signal;

a texture pattern extractor for extracting texture-emphasized image data in which a texture pattern coming from properties of a tissue in said living body is emphasized from said video signal;

an image synthesizer for obtaining a synthesized image by weighting and combining said structure-emphasized image data and said texture-emphasized image data;

a scan converter to which an output signal of said image synthesizer is input as a video signal;

a parameter controller for setting parameters for signal processing into said structure extractor,

said texture pattern extractor, and said image synthesizer;

an input unit for receiving said parameters for signal processing and setting said parameters for signal processing into said parameter controller;

a control unit for controlling said transmit beam former, said transmit/receive switch, and said receive beam former on the basis of the control parameters supplied from said input unit; and

a display for displaying at least one of said structure-emphasized image data, said texture-emphasized image data, and said synthesized image.

15. The ultrasonic imaging system according to claim 14, wherein said parameter controller sets said parameters for signal processing on the basis of said video signal.

16. An ultrasonic imaging system for transmitting an ultrasonic pulse to a living body, receiving the ultrasonic pulse reflected by said living body, and obtaining B-mode image data of said living body, comprising:

a structure extractor for extracting structure-emphasized image data in which a structure of a tissue of said living body is emphasized by using data of said B-mode image;

a texture pattern extractor for extracting

texture-emphasized image data in which a texture pattern coming from properties of a tissue in said living body is emphasized by using said B-mode image data in parallel with said structure extractor;

an image synthesizer for obtaining a synthesized image by weighting and combining said structure-emphasized image data and said texture-emphasized image data; and

a display for displaying at least one of said structure-emphasized image data, said texture-emphasized image data, and said synthesized image.

17. An ultrasonic imaging system having means of transmitting an ultrasonic pulse to a living body, receiving the ultrasonic pulse reflected by said living body, and obtaining B-mode image data of said living body, a structure extractor for extracting structure-emphasized image data in which a structure of a tissue in said living body is emphasized from said B-mode image data, and a display for displaying said structure-emphasized image data,

wherein said structure extractor comprises:

means for determining a region of peripheral pixels of each pixel of said B-mode image data; and

means for obtaining a function for determining a weighting function on the basis of the difference between intensity of said each pixel and intensity of each of said peripheral pixels,

said function has a maximum point when it is 0,

an integral value of an absolute value of said function in a region from negative infinity to positive infinity is finite,

said weighting function for each of said peripheral pixels is determined from differentiation of said function, and

a value obtained by adding a sum of products of said weighting function and intensity of each of said peripheral pixels to intensity of each of pixels of said B-mode image data is used as signal intensity of each of pixels of said structure-emphasized image data.

18. An ultrasonic imaging system for transmitting an ultrasonic pulse to a living body, receiving the ultrasonic pulse reflected by said living body, and obtaining B-mode image data of said living body, comprising:

an image memory for storing said B-mode image data;

a structure extractor for extracting structure-emphasized image data in which a structure of a tissue in said living body is emphasized from data in said image memory;

a texture pattern extractor for extracting texture-emphasized image data in which a texture pattern coming from properties of a tissue in said living body is emphasized from data in said image

memory;

an image synthesizer for obtaining a synthesized image by weighting and combining said structure-emphasized image data and said texture-emphasized image data; and

a display for displaying at least one of said structure-emphasized image data, said texture-emphasized image data, and said synthesized image.

19. The ultrasonic imaging system according to claim 18, wherein said structure extractor extracts a structure of a living body tissue constructed by a set of point reflectors which are continuously distributed in at least one direction in said living body.

20. The ultrasonic imaging system according to claim 18, wherein said texture pattern extractor extracts a component coming from a reflector constructed by a set of point reflectors which are not continuously distributed in said living body but are spread.

21. The ultrasonic imaging system according to claim 18, wherein said structure extractor comprises:

means for determining a region of peripheral pixels of each pixel of said B-mode image data; and

means for obtaining a function for determining a weighting function on the basis of the difference between intensity of said each pixel and intensity of

each of said peripheral pixels,

said function has a maximum point when it is 0,

an integral value of an absolute value of said function in a region from negative infinity to positive infinity is finite,

said weighting function for each of said peripheral pixels is determined from differentiation of said function, and

a value obtained by adding a sum of products of said weighting function and intensity of each of said peripheral pixels to intensity of each of pixels of said B-mode image data is used as signal intensity of each of pixels of said structure-emphasized image data.

22. An ultrasonic signal processing method of transmitting/receiving an ultrasonic pulse to/from a living body, converting an obtained reflected echo signal, and performing signal process on B-mode image data, comprising:

a structure emphasizing step of extracting structure-emphasized image data in which a structure of a tissue in said living body is emphasized from said B-mode image data;

a texture pattern emphasizing step of extracting texture-emphasized image data in which a texture pattern coming from properties of a tissue in said living body is emphasized from said B-mode image data; and

an image synthesizing step of obtaining a synthesized image by weighting and combining said structure-emphasized image data and said texture-emphasized image data.

23. The ultrasonic signal processing method according to claim 22, wherein in said step of extracting a structure of a tissue in said living body, a structure of a living body tissue constructed by a set of point reflectors which are continuously distributed at least in one direction in said living body is extracted.

24. The ultrasonic signal processing method according to claim 22, wherein in said texture pattern extracting step, a component coming from a reflector constructed by a set of point reflectors which are not continuously spread in said living body but are spread is extracted.

25. The ultrasonic signal processing method according to claim 22, wherein said structure extracting step includes:

a step of determining a region of peripheral pixels of each pixel of said B-mode image data;

a step of obtaining a function for determining a weighting function on the basis of the difference between intensity of said each pixel and intensity of

each of said peripheral pixels;

a step of determining said weighting function for each of said peripheral pixels from differentiation of said function; and

a step of using a value obtained by adding a sum of products of said weighting function and intensity of each of said peripheral pixels to intensity of each of pixels of said B-mode image data as signal intensity of each of pixels of said structure-emphasized image data,

said function has a maximum point when it is 0, and

an integral value of an absolute value of said function in a region from negative infinity to positive infinity is finite.

26. The ultrasonic signal processing method according to claim 22, wherein parameters for signal processing in said structure extracting step, said texture pattern extracting step, and said image synthesizing step are set on the basis of a distribution of signal intensities of pixels in the same frame of said B-mode image data.

27. The ultrasonic signal processing method according to claim 22, wherein said texture pattern extracting step emphasizes said texture pattern by using a differential filter in two directions of signal intensities of pixels in the same frame of said B-mode

image data.